REMARKS

OVERVIEW

Claims 8-13 and 15-17 are pending in this application. Minor amendments have been made to claims 8, 16 and 17 to improve clarity and place the claims in proper form for allowance or appeal. A Notice of Appeal accompanies this response.

ISSUES UNDER 35 U.S.C. § 112

Claims 8-13 and 15-17 have been rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. In particular, the Examiner states that "the disclosure, as originally filed, fails to provide support for 'metal film oxides'" (Office Action, page 2, numbered paragraph 2). Claims 8, 16 and 17 have been amended so that they refer to "metal oxides". To further clarify, the limitation of "thin film" has been added to modify the "resistive element". Therefore, it is respectfully submitted that these rejections should be withdrawn. The fact that a mixture of metal oxides is used to form a thin film resistive element is explicit within the specification as originally filed. See page 4, lines 23-25 ("The metal oxide film 16 is a mixture of metal oxides such as manganese oxide or nickel oxide"); page 5, lines 20-21 ("The thin film thermistor 22 has a resistive element 24 which is of the metal oxide mixture"). Therefore, this amendment is well supported in the specification as originally filed.

ISSUES UNDER 35 U.S.C. § 103

Claims 8-10 and 16 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 3,574,930 to Riddel et al. in view of U.S. Patent No. 6,099,164 to Rosen et al. and further in view of U.S. Patent No. 4,423,403 to Miyake et al.

Riddel is directed towards thermistor assemblies (Abstract). The Examiner recognizes that Riddel fails to disclose selecting a negative temperature coefficient of resistance versus temperature curve and sputter depositing a mixture of metal oxide film (Office Action, page 3, first full paragraph). This assembly is then heated to oxidize a layer of the nickel. The thermistor material is applied to the nickel substrate by means of printing with a silkscreen (column 2, lines 69-71). Therefore, it is respectfully submitted that a mixture of metal oxides is not deposited using "a thin film process" as required by claim 8. To further clarify that the thermistor of Riddel is significantly different from the thermistor of the present invention, claims 8 and 16 have been amended to explicitly require that the substrate is "alumina". This limitation is expressly disclosed in page 4 of the original specification, lines 13-15 which state "The substrate 12 may be alumina or other substrate that is used in thin film processes". Due to the significant different in the manner in which the resistor is formed and the resulting structural differences, including the limitations of the "alumina" substrate and the limitation of the metal oxides being deposited using "a thin film process" it is respectfully submitted that this rejection to claim 8 should be withdrawn. As the same limitation of "an alumina substrate" is now found in claim 16, it is respectfully submitted that this rejection should also be withdrawn. As claims 9 and 10 depend from claim 8, it is respectfully that these rejections should be withdrawn on this basis as well.

It is further noted that neither Rosen nor Miyake alone or in combination remedy all these deficiencies. Rosen et al. is directed towards a nickel-manganese oxide single crystal. A resistive element would be made of this monocrystalline spinel (column 14, lines 27-43). Because Rosen is directed towards monocrystalline structures and Riddel is not, it would not have been obvious to combine these references in the manner suggested by the Examiner.

Moreover, there is no disclosure in Rosen et al. that different crystalline structures that would provide different negative temperature coefficient of resistance properties have the same size. Therefore, it is respectfully submitted that this combination of Riddel and Rosen is improper and the rejections should be withdrawn on this basis as well.

The Examiner is correct in that Miyake et al. discloses sputter depositing a mixture of metal oxide film. However, depositing of such film is in a different context and nothing in Miyake et al. would suggest combining it with Riddel and Rosen. It is further noted that Riddel specifically teaches away from sputter depositing a mixture of metal oxide film because Riddel uses a nickel substrate and then oxidizes the nickel substrate to produce its metal oxide. Because a nickel substrate is used in Riddel, there would be no reason to sputter deposit a metal oxide film when one could be formed through oxidation. Therefore, it is respectfully submitted that the Examiner's combination of Riddel with Miyake is improper and the rejections to claims 8-10 and 16 should be withdrawn on this basis as well.

Claims 11-13 and 15 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 3,574,930 to Riddel et al., U.S. Patent No., 6,099,164 to Rosen et al., U.S. Patent No. 4,423,403 to Miyake et al. in view of U.S. Patent No. 6,314,637 to Kimura et al. and further in view of Bunshah et al. (Deposition Technologies for Films and Coatings) and U.S. Patent No. 4,498,071 to Plough, Jr. et al. These rejections are respectfully traversed. It is noted that claims 11-13 and 15 depend from claim 8. Therefore, it is respectfully submitted that these rejections should all be withdrawn for the reasons previously stated. In addition, there are independent reasons for patentability.

Claim 11 requires "planarizing" a substrate. Riddel et al. has a nickel substrate and does not disclose planarizing a substrate. Rosen is directed towards a crystal and does not disclose

planarizing a substrate. Moreover, Miyake does not appear to disclose planarizing a substrate. It is noted that the Examiner does not specifically cite to a particular reference of Riddel, Rosen, or Miyake for this proposition, so it is unclear as to what the Examiner believes is the basis for the rejection. Thus, the Examiner has failed to make a *prima facie* case of obviousness. Therefore, it is respectfully submitted that this rejection to claim 11 should be withdrawn for this independent reason.

Claim 17 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 3,574,930 to Riddel et al. in view of Buhshah et al. (Deposition Technologies for Films and Coatings). Claim 17 now requires that the substrate be "an alumina substrate". Riddel discloses only a nickel substrate. It would not have been obvious to modify Riddel by replacing the nickel substrate with an alumina substrate because it is critical to Riddel that the nickel substrate oxidizes to form the nickel oxide. This nickel oxide is formed through the oxidation process and not through "sputter depositing" as required by claim 17. Therefore, it is respectfully submitted that this rejection to claim 17 should also be withdrawn.

OTHER MATTERS

The Examiner has requested the Applicant provide reference numerals to all claim limitations as well as support in the disclosure for better clarity. The Applicant notes that a number of the claims are the original claims which are part of the original disclosure. The Applicant further notes that all pending claims are method claims as opposed to apparatus claims, therefore there would not be reference numerals for all claim limitations. Therefore, the Applicant is unclear how this will assist the Examiner. Nevertheless, following is the table requested by the Examiner.

Claim 8 (Currently Amended): A method of manufacturing a thin film negative temperature coefficient thermistor comprising: selecting a mixture of metal ~~film~~ oxides to provide the negative temperature coefficient of resistance versus temperature curve while maintaining a standardized physical size for the thermistor; and sputter depositing the mixture of metal ~~film~~ oxides on ~~a~~ an alumina substrate using a thin film process to form a resistive element.	Original Claim 8; "The metal oxide film 16 is a mixture of metal oxides" (p.4, lines 23-24); "The metal oxide film materials selected in the mixture of metal oxide film materials used is selected in part by the desired temperature response" (p. 4, lines 25-27); "This metal oxide mixture film is deposited using sputtering (p. 4, last line – p. 5, Line 1); "The precise ratio selected affects the resistance of the film NTC thermistor at various temperatures. Thus, different mixtures of metal oxides may be used to achieve different properties in the resulting NTC thermistor" (p. 6, lines 17-21); "The particular mixture selected based on the desired properties of the thermistor such as the size of the thermistor and the associated curve of the thermistor" (p. 6, lines 23-25); "NTC thermistors having different curves to be manufactured in the same size" (p. 6, lines 4-5); "two different NTC thermistors having the same physical size to have different curves" (p. 8, lines 14-15); "package sizes to be standardized" (p. 8, line 16); "the substrate 12 may be alumina or other substrate that is used in thin film processes" (p. 4, lines 13-14).
Claim 9 (Original): The method of claim 8 further comprising: associating a negative temperature coefficient of resistance versus temperature curve with the thin film negative temperature coefficient thermistor.	Claim 9 (Original): The method of claim 8 further comprising: associating a negative temperature coefficient of resistance versus temperature curve with the thin film negative temperature coefficient thermistor.
Claim 10 (Previously presented): The method of claim 8 wherein the mixture is a mixture of manganese oxide and nickel oxide.	"a mixture of 82% Mn_2O_3 to 18% N_iO" (p. 4, lines 28-19)
Claim 11 (Original): The method of manufacturing a thin film negative temperature coefficient thermistor of claim 8 further comprising: planarizing a substrate prior to the depositing step;	Claim 11 (Original): The method of manufacturing a thin film negative temperature coefficient thermistor of claim 8 further comprising: planarizing a substrate prior to the depositing step;

sputtering conductor terminals; sputtering a passivation layer; and heat treating.	sputtering conductor terminals; sputtering a passivation layer; and heat treating.

Claim 12 (Original): The method of claim 11 wherein the step of planarizing is applying silicon nitride film.	Claim 12 (Original): The method of claim 11 wherein the step of planarizing is applying silicon nitride film.
Claim 13 (Original): The method of claim 11 wherein the step of sputtering a passivation layer is sputtering silicon nitride film.	Claim 13 (Original): The method of claim 11 wherein the step of sputtering a passivation layer is sputtering silicon nitride film.
Claim 15 (Previously presented): The method of claim 8 wherein the step of depositing is sputter depositing.	"This metal oxide mixture film is deposited using sputtering (p. 4, last line to p. 5, line 1)
Claim 16 (Currently Amended): A method of manufacturing a thin film negative temperature coefficient thermistor, comprising: selecting a mixture of metal ~~film~~ oxides to provide desired negative temperature coefficient of resistance properties and sputter depositing the metal film oxides on ~~a~~ an alumina substrate to form a thin film resistive element.	"The metal oxide film 16 is a mixture of metal oxides" (p.4, lines 23-24); "The metal oxide film materials selected in the mixture of metal oxide film materials used is selected in part by the desired temperature response" (p. 4, lines 25-27); "This metal oxide mixture film is deposited using sputtering (p. 4, last line – p. 5, Line 1); "The precise ratio selected affects the resistance of the film NTC thermistor at various temperatures. Thus, different mixtures of metal oxides may be used to achieve different properties in the resulting NTC thermistor" (p. 6, lines 17-21); "The particular mixture selected based on the desired properties of the thermistor such as the size of the thermistor and the associated curve of the thermistor" (p. 6, lines 23-25); "NTC thermistors having different curves to be manufactured in the same size" (p. 6, lines 4-5); "two different NTC thermistors having the same physical size to have different curves" (p. 8, lines 14-15); "package sizes to be standardized" (p. 8, line 16); "the substrate 12 may be alumina or other substrate that is used in thin film processes" (p. 4, lines 13-14).

Claim 17 (Currently Amended): A method of manufacturing a thin film negative temperature coefficient thermistor of a standardized package size, comprising sputter depositing a mixture of metal ~~film~~ oxides on ~~a~~ an alumina substrate to form a thin film resistive element, the mixture of metal ~~film~~ oxides selected to provide for desired negative temperature coefficient of resistance properties while maintaining the standardized package size.	"The metal oxide film 16 is a mixture of metal oxides" (p.4, lines 23-24); "The metal oxide film materials selected in the mixture of metal oxide film materials used is selected in part by the desired temperature response" (p. 4, lines 25-27); "This metal oxide mixture film is deposited using sputtering (p. 4, last line – p. 5, Line 1); "The precise ratio selected affects the resistance of the film NTC thermistor at various temperatures. Thus, different mixtures of metal oxides may be used to achieve different properties in the resulting NTC thermistor" (p. 6, lines 17-21); "The particular mixture selected based on the desired properties of the thermistor such as the size of the thermistor and the associated curve of the thermistor" (p. 6, lines 23-25); "NTC thermistors having different curves to be manufactured in the same size" (p. 6, lines 4-5); "two different NTC thermistors having the same physical size to have different curves" (p. 8, lines 14-15); "package sizes to be standardized" (p. 8, line 16); "the substrate 12 may be alumina or other substrate that is used in thin film processes" (p. 4, lines 13-14).

STRUCTURAL ELEMENT	REFERENCE NUMERAL
Thin film negative temperature coefficient thermistor	22
Substrate	12
Resistive element	24
Moisture barrier	26
Polymer dielectric	28
Terminal	30
Nickel barrier	32
Solder material	34

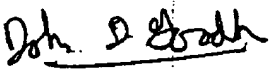
Therefore, it is respectfully submitted that this amendment places all claims in proper form for immediate allowance. Reconsideration and passage to issuance is therefore respectfully requested.

This amendment accompanies a notice of appeal.

No additional fees or extensions of time are believed to be due in connection with this amendment; however, consider this a request for any extension inadvertently omitted, and charge any additional fees to Deposit Account No. 26-0084.

Reconsideration and allowance is respectfully requested.

Respectfully submitted,



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